Item 1. Basalt Strike and Dip

The geometry of the lava flows affects the transport of both LNAPL and dissolved phase contamination. This is particularly true for LNAPL transport within the vadose zone. Characterizing the geometry of the lava flows – in particular, the predominant strike and dip and the variations about these predominant values - is critical to adequately assess the risk the Red Hill Bulk Fuel Storage Facility poses to potential groundwater receptors (Inset Figure 1.1).

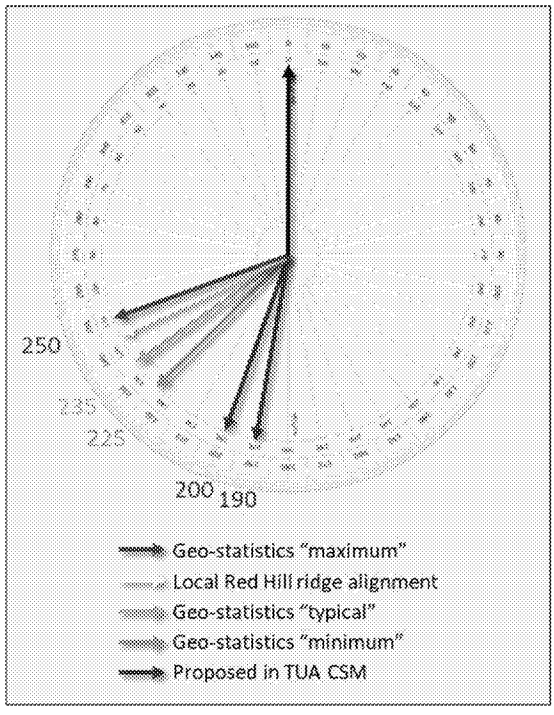

Figure [SEQ Figure * ARABIC].1 Estimated Dip Directions in and Around Red Hill

The reported strike and dip of the lava flows reported by consultants to the Navy differs from values obtained independently through (a) field observation and (b) geostatistical analysis of barrel log data (Inset Figure 1.1).

Difficulties can be encountered applying strike and dip measurements made at an outcrop face (where the scale is on the order of inches to feet) to the site scale where distances on the order of many hundreds to thousands of feet must be considered. There is also likely to be variability throughout the area, as a function of paleotopography, flow volume, and other factors.

When there are a variety of data sources it is appropriate to combine the various available data sources while considering their representative scales, to obtain a representative best-estimate at the scale of most interest to the evaluation of fate-and-transport (i.e., on the order of hundreds or more feet). Lines of evidence include (a) close-quarters outcrop measurements such as obtained with a compass-clinometer, (b) more distal surveys of visible outcrop from a distance that allows the geometry of a continuous bed-set to be followed for many tens or hundreds of feet, and (c) geostatistical analysis of the barrel log data. The resulting best-estimate derived from combining these lines of evidence can be to some extent corroborated by intersecting the derived plane with a digital elevation model for comparison with features observed in the field (Inset Figure 1.2).

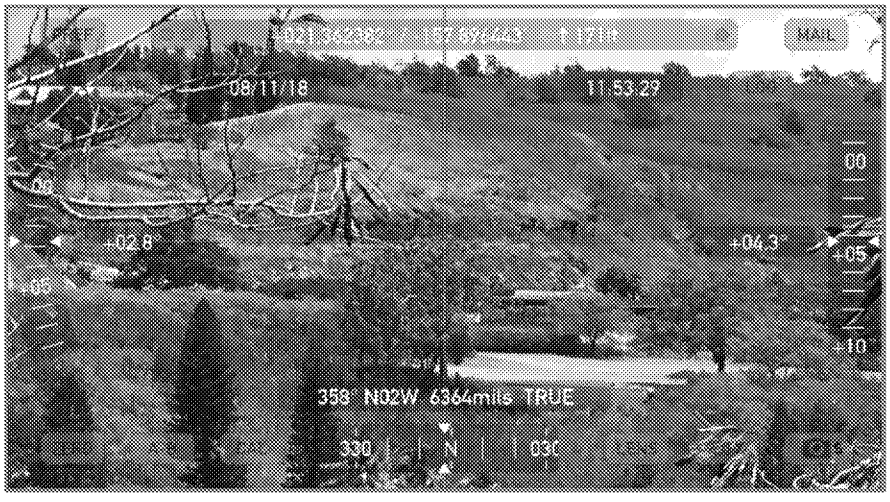

Figure 1.2 Example of Extensive Correlatable Units Viewed from a Distance using a Theodolite Application for a Camera